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### Remarks

**For the Specification:**

Applicant amends the specification at paragraphs [010] and [060] to correct minor typographical and/or grammatical errors. These amendments add no new subject matter.

**For the Claims:**

Applicant originally submitted claims 1-23. In a first Office Action dated 9 July 2004, claims 1-23 were rejected. The first Office Action rejected claims 1, 10-13, 15, and 20 under 35 U.S.C. 102(b) as being anticipated by Wallace, U.S. Patent No. 6,463,272. In addition, the first Office Action rejected claims 2-4, 14, 16-18, and 21-23 over Wallace in view of Tanaka, U.S. Patent No. 6,731,928. Claims 5, 6, 7, 9, and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wallace in view of Tanaka and further in view of Chern, U.S. Patent No. 6,609,005, and claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace in view of Tanaka, and in view of Chern, and further in view of Beamish, U.S. Patent No. 6,694,143.

In response to the 9 July 2004 first Office Action, Applicant submitted an Amendment on 8 October 2004. The Amendment canceled claims 6, 16-17, 19, and 21-23, amended claims 1, 7, 9, and 18, added claims 24-31, and retained claims 2-5, 8, 10-15, and 20. Consequently, claims 1-5, 7-15, 18, 20, and 24-31 are pending in the above-identified application.

In Response to the Amendment, this Final Office Action acknowledges the cancellation of claims 6, 16-17, 19, and 21-23, and acknowledges the addition of claims 25-31. It should be

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noted, however, that claim 24 was also added in Applicant's Amendment. The addition of claim 24 is reflected on the Office Action Summary page as well as in connection with Claim Objections and Claim Rejections in the detailed action. Accordingly, the Final Office Action also implicitly acknowledges the addition of claim 24. This Final Office Action now rejects all claims, i.e., claims 1-5, 7-15, 18, 20, and 24-31.

This Amendment After Final Office Action cancels claims 7, 9, 18, and 20. In addition, this Amendment amends claims 1-5, 8, 10-15, 24, and 26-31, and retains claim 25 as previously presented. Applicant respectfully requests reconsideration in view of the amendments and the following remarks.

Claims 2-5, 7-15, 20, 24, and 26-31 were objected to because of an alleged informality. In particular, the Office Action indicates that the phrase "A method" should be changed to "The method." Claims 2-5, 8, 10-15, and 26-31 are being amended to replace the phrase "A method" to "The method." Claims 7, 9, and 20 are being canceled, and claim 24 is being amended to independent form to include all limitations of claim 1, as presented in the 8 October 2004 Amendment. Accordingly, the objection to claims 2-5, 7-15, 20, 24, and 26-31 due to an informality has been overcome.

This Final Office Action rejects claims 1-20, 25, 27, and 29-31 under 35 U.S.C. 103(a) as being unpatentable over Wallace in view of Marlevi et al. (U.S. Patent No. 5,572,221). Wallace, also cited in the first Office Action, teaches of a pager that includes a global positioning system receiver so that the pager may be interrogated by a remote requester for the user's current location. Marlevi et al. (hereinafter Marlevi) teach of methods

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and apparatus for detecting and predicting movement patterns of mobile radio transceivers.

Regarding claim 1, the Office Action alleges that Wallace largely teaches Applicant's invention, but acknowledges that Wallace fails to teach Applicant's activating operations of predicting a potential location area of the wireless communication device and initiating the location determination process in the potential location area. The Office Action indicates that Marlevi teaches the predicting and initiating operations of claim 1. The Office Action indicates that it would have been obvious to combine the teachings of Wallace and Marlevi to render obvious Applicant's invention of claim 1.

Independent claim 1 is being amended to include the limitations of dependent claim 7, which formerly depended from claim 1, and dependent claim 9, which formerly depended from claim 7. Consequently, claims 7 and 9 are being canceled. In addition, claim 8 is being amended to correct its dependency in response to the cancellation of claim 7. That is, claim 8 is being amended to now depend from claim 1.

The preamble of amended independent claim 1 was amended to include a limitation formerly recited in claim 9 where a service provider maintains a comprehensive call history database of the wireless communication network, the comprehensive call history database including call records of past calls in which the wireless communication device participated. In addition, independent claim 1 was amended to include a limitation of the predicting operation including determining the potential location area in response to wireless communication between the wireless communication device and a transceiver site of the wireless

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communication network by ascertaining the potential location area from the comprehensive call history database.

Regarding the rejection of claim 9, now applicable to amended independent claim 1, this Final Office Action alleges that Marlevi teaches a method in which a service provider maintains a comprehensive call history database of the wireless communication network, the comprehensive call history database including call records of past calls in which the wireless communication device participated. The Final Office Action further alleges that Marlevi teaches that the determining operation comprises ascertaining the potential location area from the comprehensive call history database. The Final Office Action cites passages in Marlevi at column 7, lines 16-42, and at column 8, lines 5-10, as providing the alleged teaching.

At issue here is: when given a fair reading, does the prior art teach or suggest all of Applicant's limitations of amended independent claim 1? No. Notably, and as discussed in detail below, Marlevi fails to teach or suggest of determining the potential location area of a wireless communication device by ascertaining the potential location area from a comprehensive call history database, as recited in amended independent claim 1. Consequently a combination of Wallace and Marlevi cannot render obvious Applicant's invention of claim 1.

Marlevi teaches of a mobile motion predictor in a user's mobile station or in the network that detects patterns (itinerary patterns) in a user's movements between locations, saves these patterns in an itinerary pattern database, and utilizes the information stored in the itinerary pattern database to predict the next location of the user. The Marlevi itinerary pattern database is unrelated to the claimed comprehensive call history

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database, despite Office Action intimation to the contrary. Nor are the itinerary patterns stored in the IPD related to call records of past calls stored in the comprehensive call history database, as recited in claim 1.

Marlevi operates under the assumption that most people, including mobile terminal users, have regular patterns of movement that they follow more or less every day. Marlevi utilizes this regularity in movements to predict a mobile user's next location. To do so, Marlevi populates an itinerary pattern database (IPD) with itinerary patterns, each of which is a user's sequence of movements between locations, or states (column 7, lines 16-42, and at column 8, lines 5-10). These itinerary patterns, or regular patterns of movement, can subsequently be utilized to predict the next location, or state, of a user.

In order to generate these itinerary patterns, Marlevi describes an exemplary cellular mobile radiotelephone system having base stations that broadcast control information over one or more control channels (col. 6, lines 29-42). A mobile station receives the information broadcast on a control channel. The mobile station's processing unit evaluates the received control channel information, and determines on which cell the mobile station should lock. This received control channel information includes "absolute information" concerning the cell (col. 6, lines 43-57).

Marlevi incorporates by reference U.S. Pat. No. 5,353,332 to Raith et al., which provides an explanation of "absolute information." Per Raith, absolute information includes information about the particular cell corresponding to the control channel on which the information is being broadcast. This information might include the service profile of that cell,

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the control channel organization, and/or the type of cell. Raith explains that a mobile unit must be locked to a particular cell in a location area so that the mobile station can receive a page. Consequently, the Marlevi itinerary pattern detector ascertains a current location area, i.e., state, of the mobile station utilizing the absolute information in the received control channel information. A sequence of detections of states (locations) of the mobile station yields an itinerary pattern.

Since Marlevi utilizes received control channel information to produce itinerary patterns and Marlevi utilizes these itinerary patterns to predict a user's location, Marlevi need not ascertain a potential location area of a user from a call history database, as recited in claim 1. Indeed, Marlevi suggests away from such an activity because Marlevi can predict potential location of a mobile station utilizing control channel information regardless of call history. Moreover, control channel information is received as the mobile station locks onto each cell through which it moves, whereas calls may not necessarily take place in every cell through which the mobile station moves. Consequently, the development of itinerary patterns utilizing control channel information may yield accurate location predictions without the use of a call history database.

Although there may be other systems and methods, such as those taught by Marlevi, for predicting a potential location of a mobile station, only Applicant teaches of ascertaining a potential location area from a call history database. Applicant has discovered that call records, presently accumulated in the comprehensive call history database, may be advantageously utilized to predict a potential location area of a wireless communication device, hence its user. Moreover, since the comprehensive call history database is existing, service

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providers can readily, and cost effectively, implement this into a current location information service.

A cellular service provider collects call-history information for a call in a comprehensive call history database of call records for the subscribers operating in the wireless communication network. These call records are utilized by the service provider for record keeping purposes, such as billing and for providing subscribers with enhanced services, such as last numbers dialed, caller ID, and so forth (Applicant's specification page 7, lines 9-28). However, the collection of call records of past calls and maintenance of a comprehensive call history database for the purposes of predicting wireless communication device location was unknown.

Only Applicant teaches of ascertaining the potential location area from a comprehensive call history database of the network provided by a service provider, the comprehensive call history database including call records of past calls in which the wireless communication device participated, as recited in amended independent claim 1. That is, when Wallace and Marlevi are reviewed without the benefits of Applicant's disclosure it is readily apparent that a combination of Wallace and Marlevi fails to render obvious Applicant's invention of claim 1.

Accordingly, for the reasons set forth above, Applicant believes amended independent claim 1 is allowable. Claims 2-5, 8, and 10-15 depend directly or indirectly from claim 1. As such, claims 2-5, 8, and 10-15 are also allowable for the reasons set forth above.

Independent claim 25, and dependent claims 27 and 29-31 were also rejected in view of a combination of Wallace and Marlevi.

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Independent claim 25 includes the limitations of predicting a potential location area of the wireless communication device, when the wireless communication device is detectable in the potential location area initiating a location determination process in the potential location area to determine a current location of the wireless communication device, and when the wireless communication device is undetectable in the potential location area, utilizing the potential location area as the location.

The Final Office Action alleges that Marlevi teaches Applicant's predicting, initiating, and utilizing operations of claim 25. In particular, the Final Office Action cites passages at column 9, lines 29-32, and column 16, lines 10-29 as an alleged teaching of when the wireless communication device is undetectable in the potential location area, utilizing the potential location area as the location.

The passage at column 9, lines 29-32, teaches that when considering a movement track, one must move along the track in a known direction because the order of the states may differ for different directions.

The passage at column 16, lines 10-29, teaches of predictive mobility management (PMM) functions that involve predictions of the mobile terminal's location and Virtual-Distributed Floating Agent Assignment (FAA) functions, which assign the agent to different locations according to the location predictions and provide service pre-connection and service/resource mobility. The cited passage further teaches of Location-Sensitive Information Management (LSIM) functions that inform applications and agents in the mobile network supporting the applications about changes in location of a mobile terminal and provides

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dynamical service connections. For example, if a mobile terminal were to move from a location near one of the servers to a location near another server, the LSIM would inform both the second server and the cache manager in the mobile terminal that the second server is the nearest, should a fetch of a file be required.

The cited passages, and indeed the *Marlevi* patent alone or in combination with *Wallace*, fail to provide any teaching or suggestion of the claim 25 feature of utilizing the potential location area as the location when the wireless communication device is undetectable in the potential location area. *Marlevi* ascertains a current location area, i.e., state, of the mobile station utilizing the absolute information in the received control channel information. In addition, *Marlevi* bases location predictions on comparing a current sequence of movement locations of a mobile terminal with each of a plurality of stored itinerary patterns so as to predict a next, or future, location of the mobile terminal based on a selected one of the stored itinerary patterns. However, *Marlevi* utterly fails to teach or suggest that when the wireless communication device is undetectable in the *Marlevi* predicted next location that the predicted next location is the location of the wireless terminal in the wireless communication network.

Therefore, within the context of the *Marlevi* reference, utilizing the (predicted) potential location area as the location of the mobile terminal when the wireless communication device is undetectable in the *Marlevi* predicted next location area amounts to speculation in an attempt to deprecate the invention of claim 25. Applicant's invention of claim 25 allows for the provision of approximate location information to a requester in the event that the wireless communication device is not on or cannot be

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located. By receiving the approximate location information, the requester can take appropriate action.

For the reasons set forth above, Applicant believes independent claim 25 is allowable. Claims 26-31 depend directly or indirectly from claim 25. As such, claims 26-31 are also allowable for the reasons set forth above.

Claim 29, which depends from claim 25, recites subject matter similar to that presented in independent claim 1. That is, claim 29 recites a service provider of the wireless communication network maintains a comprehensive call history database of the wireless communication network, the comprehensive call history database including call records of calls in which the wireless communication device participated, and the predicting operation comprises ascertaining the potential location area from the comprehensive call history database. Accordingly, claim 29 is believed allowable for the reasons set forth in connection with amended independent claim 1.

Claims 24, 26, and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wallace in view of Marlevi and further in view of Song (U.S. Patent No. 6,327471). Song teaches of a method and apparatus for acquiring satellite signals to establish the exact spatial position of a cellular radio telephone, in order to perform a timely dropoff or smooth handoff to another base station or frequency.

Regarding claim 24, claim 24 was amended to independent form to include all limitations of claim 1, as presented in the 8 October 2004 Amendment. The Office Action indicates that a combination of Wallace and Marlevi teach the limitations of claim 1, from which claim 24 formerly depended, and acknowledges that

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the hypothetical combination fails to teach a method in which the predicting operation is performed irrespective of a current registration of the wireless communication device in the wireless network. The Office Action further alleges that *Song* teaches a method in which a predicting operation is performed irrespective of a current registration of the wireless communication device in the wireless network. The Office Action cites column 4, lines 42-65, and FIG. 2 as an alleged teaching of the claim 24 limitations.

Again, at issue here is: when given a fair reading, does the prior art teach or suggest all of Applicant's limitations of amended independent claim 24? No. In this case, Applicant contends that *Song* fails to teach or suggest of predicting a potential location area of a wireless communication device irrespective of a current registration of the wireless communication device in the wireless communication network, as recited in amended independent claim 24. Moreover, *Marlevi* requires current registration of a mobile terminal in order to predict a potential location of a mobile terminal. Thus, *Marlevi* would not work for its intended purpose if the *Marlevi* predictions were performed irrespective of a current registration of the mobile terminal in the wireless communication network. Consequently a hypothetical, and improper, combination of *Wallace*, *Marlevi*, and *Song* does not render obvious Applicant's invention of claim 24.

The Office Action citation within *Song* merely repeats conventional operations within CDMA systems. That is, when a radiotelephone is turned on, it registers within the CDMA system typically by transmitting identification parameters of the radiotelephone. This registration information is relayed to a MTSO so that the MTSO is able to route calls between the public

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switched telephone network and various cells of the CDMA system. In a CDMA system, radiotelephones are paged in various cells in order to identify the cell in which the radiotelephone is located, for call routing purposes. To do so, the CDMA system needs to determine the set of cells that the radiotelephone may have entered. According to the *Song* reference, a process known as registration enables a group of cells, within which the radiotelephone would most likely be located, to be identified. In this *Song* zone registration technique, the amount of paging in the cellular system is reduced by dividing the system into zones and the radiotelephone is paged at all cells within the zone.

In order to identify the group of cells within which the radiotelephone is most likely to be located, the radiotelephone must be currently registered within the CDMA system, even though its exact location may be unknown. Accordingly, Applicant believes that *Song* does not teach that the predicting operation of claim 24 can be performed irrespective a current registration of the wireless communication device in the wireless communication system.

Even if prior art could be found teaching the claim 24 limitation of predicting a potential location area of a wireless communication device irrespective of a current registration of the wireless communication device in the wireless network, such prior art could not be reasonably be combined with Marlevi in order to render obvious Applicant's invention. Such a combination could not be made because the Marlevi techniques require detection of the mobile terminal at a current location and knowledge of previous locations to select the most closely matching itinerary pattern from the itinerary pattern database, so as to predict a future location of the mobile terminal. Of course, in order to detect a mobile terminal at a current

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location, it must be registered in the wireless network. Thus, if the mobile terminal was not currently registered within the Marlevi wireless network, the system could not even begin to access the itinerary pattern database to predict a potential location area of the mobile terminal.

It is only Applicant's specification that teaches of predicting a potential location area of a wireless communication device irrespective of a current registration of the wireless communication device in a wireless network. Such an approach is useful for predicting the potential location area of the wireless communication device when the device is not currently registered, for example, when the device is not on or cannot be located. In one embodiment disclosed in Applicant's specification, the potential location area of a wireless communication device may be ascertained by accessing a comprehensive call history database and selecting the latest call record in date and time of day that is associated with the device. This call record includes identifiers for a cell site and sector within the cell site (i.e., a coverage area). When the wireless communication device is not currently registered, the potential location area is predicted to be the coverage area in which the wireless device was last used as found in the call records. By receiving the approximate location information, the requester can take appropriate action. Consequently, service providers can readily, and cost effectively, implement the features recited in claim 24 into a current location information service.

Only Applicant teaches of predicting the potential location area of a wireless communication device irrespective a current registration of the wireless communication device in the wireless communication network, as recited in amended independent claim 1. That is, when Wallace, Marlevi, and Song are reviewed without the

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benefits of Applicant's disclosure it is readily apparent that a combination of Wallace, Marlevi, and Song fails to render obvious Applicant's invention of claim 24. Accordingly, for the reasons set forth above, Applicant believes amended independent claim 24 to be allowable.

Claims 26 and 28, which depend from independent claim 25 are allowable for the reasons set forth above in connection with claim 25. In addition, claim 26 includes the limitation of the predicting operation being performed irrespective of a current registration of the wireless communication device in the wireless communication network. Accordingly, claim 26 is believed allowable for the reasons set forth in connection with amended independent claim 24.

Accordingly, this Amendment cancels claims 7, 9, 18, and 20, amends claims 1-5, 8, 10-15, 24, and 26-31, and retains claim 25. Currently amended claims 1-5, 8, 10-15, 24, and 26-31 remain in the application and are believed to be allowable. In addition, claim 25 remains in the application as originally submitted and is believed to be allowable.

Applicant believes that the foregoing amendments and remarks are fully responsive to the rejections and/or objections recited in the 24 February 2005 Office Action and that the present application is now in a condition for allowance. Accordingly, reconsideration of the present application is respectfully requested. To the extent necessary, a petition for an extension of time under 37 C.F.R. §1.136(a) is hereby made, the fee for which should be charged to Patent Office deposit account number

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07-2347. Please charge any other fees required or credit any overpayment to this deposit account.

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